The Federal CIO Council – Capital Planning and IT Management Committee – Industry Advisory Council (IAC)

Smart Practices in Capital Planning

Acquisition/Architecture – Strategy – Business Focus – Leadership – Capital Planning – Project Management – Performance Management

The Federal CIO Council Capital Planning and IT Management Industry Advisory Council (IAC)
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EXECUTIVE SUMMARY

Capital planning is here to stay. The Office of Management and Budget has recently updated Circular A-130, "Management of Federal Information Resources" to reflect the disciplines of capital planning and enterprise architecture. The General Accounting Office recently released its IT Investment Management guide, with the goal of guiding its staff in reviewing and assessing agencies' capital planning processes. The task for executives and their staffs, then, is to effectively implement capital planning for the benefit of our organizations and programs.

For those who may not yet have recognized the permanence of capital planning and enterprise architecture, that is the most important message to take away from this document. For those who have already recognized these processes as the management tool of the foreseeable future, we have developed this "guide." We all know that IT executives' jobs are growing more complex as the technology and environment changes. All of us are looking at the need to implement more effective security, electronic government and digital signature efforts, along with delivering core programs to our customers. The goal of this guide is to provide insights into how a number of organizations, public and private, are using capital planning as a tool to help them meet their many technology and program delivery challenges.

In our role as co-chairs of the Capital Planning and IT Management Committee, we seek to promote systematic approaches to managing selection, control, implementation and evaluation processes for IT investments across the government. In support of this ongoing effort, we asked members of the Industry Advisory Council (IAC) to join with us to analyze the state of capital planning in both selected federal and private organizations, with the goal of producing this guide, "Smart Practices in IT Capital Planning." This document was presented at the IAC Executive Leadership Conference in Richmond, Virginia, in October 2000. We trust that you will find it a useful tool in improving your capital planning process.

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INTRODUCTION

Background

Federal agencies and private companies face increasing challenges managing information systems and information technology (IT). We operate in an age when information and the technological capability to deliver this information to clients and stakeholders is essential to core business strategy and in some cases the very survival of the business.

In the past, budgets, resources, and workforce often increased to meet the demand for IT-based services. Today, the funds and IT staff required to meet these new challenges and initiatives are no longer assured. The downsizing of the federal workforce, the advent of e-commerce and electronic government and the ever-present need to do things quicker and less expensively are some of the factors requiring smarter management and use of IT.

A tremendous amount of work in the area of capital planning and enterprise architecture has been done in both the private and Federal sectors. This guide reflects views from the oversight community, the agencies themselves, Federal working groups and committees and private industry. Every project or effort undertaken by the Capital Planning and IT Management Committee has included both private companies and Federal agencies. With this document, we continue that tradition. For it is in the spirit of sharing and learning that "smart practices" are discovered, proven, and emulated.

The Clinger-Cohen Act (CCA) of 1996 was undoubtedly the most significant IT reform of the last decade. CCA directs agencies to establish a comprehensive approach to planning, budgeting, procuring and managing IT. CCA also encourages the use of performance- and results-based management of these investments. CCA provides a framework which includes a methodology of a three-pronged process – a systematic capital planning and investment control process (Select, Control, Evaluate), an enterprise architecture (EA), and management of the IT workforce to ensure the skills needed to manage this framework and the processes are available.

Add to these CCA requirements the Federal Acquisition Streamlining Act's requirements that IT investments be tied to mission and strategic goals; have cost, schedule, and performance goals; and achieve, on average, 90percent of these goals, and you will see the need for a toolkit of smart practices every agency should have to function effectively.

The Deputy Director for Management at OMB stated in an interview with *the Federal Times,* "An agency's capital planning process should be rigorous, systematic and clear enough that OMB is never put in the position of 'just say no' to an IT investment."

CCA has three strong focus areas: capital planning and investment control, enterprise architecture, and the resources to accomplish both of these processes. And while there is no dictated order in which to perform these items, let's follow an example of this for a moment:

1. Establish an EA that includes its current and target states
2. Establish a systematic Capital Planning and Investment Control (CPIC) process to manage the IT investments
3. Use the EA and CPIC process to maintain the current architecture and to build the "to be" architecture
4. Use costs, schedule and performance goals to monitor and mitigate risks
5. Continuously update and manage the EA and CPIC to improve success

Is the picture becoming clear? While the legislation states what the end results should be, it also provides the flexibility to tailor the processes to meet the needs of a very large, geographically distributed organization as well as the smallest of agencies or departments. The beauty of this design is that it is the "business processes" that decide how an agency or department will perform "governance" as we move into the next millennium.

Once this governance framework is in place in an agency or company, accommodating changes in legislation, business processes or new technology will be much easier and more successful as more of the risks are mitigated and smart practices continually inform and better the processes.

An Assistant Secretary of a large Federal agency states, "Through a highly disciplined planning, budgeting and acquisition process, we must ensure that our capital projects are well planned and reviewed regularly to ensure that no dollars are wasted."

Private industry cautions that while complying with legislation and ensuring the best use of taxpayer dollars are extremely important reasons to use the capital planning process, there is another key benefit to government agencies. SOZA & Company Ltd. commented that organizations that have instituted a disciplined process are able to articulate the benefits of their projects and therefore more easily gain necessary approvals and funding.

Overview of the Smart Practices Project

In mid-FY2000, the Federal CIO Council Committees on Outreach and Capital Planning and IT Management contacted members of the Industry Advisory Council (IAC) for guidance and support for developing a set of tools. The guidance to the IAC was to keep the toolset short, to the point, and helpful. The last thing the Federal Executive needs is another burdensome task or multi-hundred-page document they can't use.

With the ongoing advice of the CIO Council Committee on Capital Planning and IT Management, the IAC, in cooperation with numerous members of the subcommittee (See Acknowledgements) undertook an effort that resulted in this document. The reader will note that the document is in fact short and to the point in that it was designed as a reference guide for Federal IT Managers, CFOs and CIOs.

In the process of developing this document, the IAC shared with the working group a team-developed questionnaire which can be used by any Federal (or Commercial for that matter) Executive to conduct a self-assessment of the adequacy of their agency, company or department capital planning process. The questionnaire is broken out into seven separate sections so that an Executive might see where shortcomings exist in their process, and help them enhance their processes. A valuable exercise might be to have a number of members involved in the capital planning process each independently complete the questionnaire and "compare notes." The questionnaire was developed in a spreadsheet format so executives can gauge the effectiveness of their process with no need to share the evaluation outside of their offices. The questionnaire is available on our Web site at http://cio.gov

Next, the team of IAC and Capital Planning members conducted interviews with several agencies and private companies deemed to have effective capital planning processes in place in specific areas of critical importance to any capital planning process. Where appropriate, this primer cites references to Web sites and agencies to contact for more detailed guidance.

One of the smart practices we have learned over the last several years in our efforts to stand up these governance processes is that "re-creating the wheel" is not a smart practice. Learning from others who have tackled the same kinds of problems is a smart practice. It is hoped that this document and the guidance it gives will enable many agencies to capture some "smart practices" of other agencies, thereby benefiting the overall efficiency of the Federal Capital Planning process.

A View from an Oversight Perspective

Over the last 10 years, OMB's monitoring of capital asset investments intensified as a legislative and policy framework evolved. The framework was designed to streamline Federal acquisition practices, improve information technology management and operate financial systems to provide managers with the information needed to perform their agency's missions.

The **Government Performance and Results Act of 1993** establishes the foundation for budget decision-making to achieve strategic goals in order to meet agency mission objectives.

The **Federal Acquisition Streamlining Act of 1994, Title V**, requires agencies to establish and achieve measurable performance goals for major acquisition programs – the Office of Federal Procurement Policy (OFPP) reports to Congress each year on agencies' progress. OFPP also is the steward of OMB's policy guidance for major systems acquisitions – **Circular A-109** and ***The Capital Programming Guide***.

The **Clinger-Cohen Act of 1996** requires agencies to use a disciplined capital planning and investment control process to acquire, use, maintain and dispose of information technology. The Office of Information and Regulatory Affairs (OIRA) reports to Congress each year on the program performance benefits achieved by agencies through IT investments (Table 22-1 in the "Analytical Perspectives" of the President's budget) and provides a full accounting of Federal IT expenditures. Through **Circular A-130**, OIRA oversees management of all Federal information resources.

The **Chief Financial Officers Act of 1990** establishes the foundation for effective financial management, including requiring agencies to develop and effectively operate and maintain financial management systems. The Office of Federal Financial Management (OFFM) monitors agencies' budget requests to ensure this objective is met, including correcting major system deficiencies. OFFM consults with agencies to correct areas of financial management not in compliance with the **Federal Financial Management Improvement Act of 1996** and the requirements of **Circular A-127**.

OMB **Circular A-11** provides unified guidance to agencies on each of these requirements and is designed to coordinate collection of agency information (e.g., financial management plans, IT portfolios and capital asset plans) necessary for OFPP, OIRA and OFFM to fulfill their statutory and policy management and reporting obligations. OMB established three priority management objectives (PMOs) to further focus attention on improving investment decision-making and management:

- Improve financial management information
- Use capital planning and investment control to better manage information technology
- Implement acquisition reforms

OMB has been working with agencies over the last few years on improving capital asset planning within agencies. The Clinger-Cohen Act (CCA) requires agencies to have a disciplined capital programming process in place that addresses thorough planning; risk management; portfolio analysis; performance-based acquisition management; accountability for meeting goals; and cost-effective life-cycle management.

OMB created the PMO "Use Capital Planning and Investment Control to better manage IT" to draw specific attention to this most important effort as we move to an electronic government. This PMO states that OMB assesses and manages the overall health and welfare of the capital planning and investment control process and the IT investments being managed through them. OMB employs CCA and this PMO during budget reviews, provides agencies an opportunity to respond and then assesses agency responses for compiling the Federal Acquisition Streamlining Act, Section V, as required by Congress.

OMB begins this process by reviewing the agencies' budget submissions, including their agency IT investment portfolio, capital asset plans and justifications, agency-documented Capital Planning and Investment Control processes, and any other related documents such as IT capital plans, strategic plans, enterprise architectures, financial management activities and plans and other documents used to inform their decision-making processes. The Federal CIO Council issued a document on best practices to implementing Capital Planning and Investment Control in 1998. OMB uses this document and other guidance documents from OMB, the CIO Council and GAO to create an assessment document. These documents, along with OMB Circulars A-11 and A-130, FASA and the CCA provide the framework for this effort.

Based on the materials provided by the agencies, OMB then meets with each agency to help improve the way they plan, acquire, manage and control their IT investments. These meetings consist of the CIO, CFO, Chief Procurement Executive and the Budget Officer, where applicable. CCA and A-11, and OMB's revisions to A-130, call for an agency's Capital Planning and Investment Control processes to be integrated and include at a minimum these agency officials. These meetings were also used as a mechanism to begin conversations about e-government, the Government Paperwork Elimination Act (GPEA), IT security, privacy and enterprise architecture.

The General Accounting Office (GAO) also participates in the oversight of agency capital planning processes. On behalf of Congress, GAO evaluates the adequacy of agency processes for selecting and managing their investments. In this work, GAO applies relevant criteria, including all OMB requirements described above, specific laws that might not be reflected in OMB requirements and good management practices gleaned from studies in both the public and private sectors. GAO publishes guidance for its evaluators, such as the IT Investment Management (ITIM) Framework (GAO/AIMD-10.1.23) described later in this document, to establish consistent criteria for the evaluators to apply across agencies. The criteria are based on applicable laws and regulations, leading practices from the public and private sectors and the advice of leaders in the field.

While OMB is charged with monitoring capital asset investments and assuring that basic management activities are carried out, GAO is often requested to look in detail at management-specific processes or problematic programs and investments.

The results of OMB's latest review of the budget and the capital planning processes for the Federal government are included in the sections of this document. Since OMB's meetings included the 24 CIO Council agencies and other departments, the information and lessons learned in the Federal sector draw from a much larger base than those interviewed for this guide.

Additionally, since the requirements of the CCA and A-130 are now included in OMB Circular A-11, all agencies are subject to this guidance and could find these "smart practices" useful as they mature their CPIC and budget reporting for information technology.

Why Do We Need This in the First Place?

Roughly eight percent of the Federal budget is now invested in IT. The Federal Government's FY2001 IT portfolio of investments totaled $39.7 billion. The IT portfolio consists of 576 major projects accounting for $17.2 billion, 1,413 significant projects totaling $15.8 billion, and the remaining $6.7 billion was reported as small projects.

Most agencies report that at least those projects identified as major projects are subject to review and approval by an internal review board prior to submission to OMB. As agencies mature their capital planning processes and the impact of IT on the business grows, this number is expected to continue to rise.

OMB reports that the overall status of Capital Planning and Investment Control (CPIC) implementation is as varied as the agencies reviewed. The CPIC processes in the Federal Government range from an integrated partnership of the Chief Information Officer (CIO), Chief Financial Officer (CFO), Chief Procurement Officer (CPO), and the business areas to one agency that has yet to document a single process.

OMB goes on to note that the agency/OMB meetings and the CPIC focus served to move some agencies forward in the implementation and revealed that other agencies were not as mature in their CPIC processes as had first been thought.

The importance of a strong investment management/capital planning process has been demonstrated time and again by the counterexamples of investments in which millions and billions of dollars have been wasted. In many cases, project budgets have been exceeded to the point where benefits were no longer greater than costs, and schedules have slipped to the point where systems were obsolete before they were fielded. Perhaps most importantly, there have been many cases where systems that were intended to meet critical mission needs were not fielded in the time frame required by the program.

The advice provided in this guide can be used for support as agencies develop their own CPIC processes. The specific design of an agency's investment process must be tailored to the environment in which the organization operates; but the regulations, existing guidance and smart practices described here can provide insights and examples which may be useful in the design process.

A program examiner at OMB states, "Implementing rigorous capital planning, disciplined investment decision-making and sound asset management, as evidenced by an agency's capital asset plans, cannot guarantee that individual projects will be funded, consistent with Administration priorities. However, a lack of planning or disciplined decision-making or poor asset management will guarantee a recommendation of no funding."

SMART PRACTICE RESULTS

Strategy

A clearly articulated mission and vision statement conveys what the company or agency does, and for whom, and maps where or what the agency would like to be in the future. A strong vision describes how the organization will accomplish its overall mission. It was clear from the organizational interviews that CPIC requires both major cultural changes and executive buy-in. Grounded in these is the need to think, plan and act strategically.

One private company, EDS, states, “Strategic planning provides the context and guidance that drives the definition of business functions, processes, systems and organization. It is the process of defining the vision, mission and long-term objectives for the business and the strategies for achieving them.”

EDS goes on to say, “The strategic planning process determines the actions and the allocation of the resources to meet those objectives. The resulting strategic plan and other associated plans allow the enterprise to effectively use its time, resources, intellectual capital and experience to transition from a current state to a new way of conducting business.”

According to the Department of Labor, the goal of capital planning is to align IT expenditures in a way that supports the department’s mission. Convincing key executives that capital planning allows the agency to do this, and is therefore in the best interests of all executives, program and administrative, is the responsibility of the CIO. Labor’s Deputy CIO offers this advice, “Don’t explain in techie terms.” The Deputy CIO said that it is important to relate CPIC to the business and quantify its benefits in terms of mission goals.

Labor also stated, the first executives to “get in the Chief Information Officer’s corner” were the Secretary and the Deputy Secretary. The CIO and the Deputy CIO were responsible, at the outset, for communicating the need for strong CPIC to these executives.

At the Department of State, the senior management official responsible for CPIC is the Under Secretary for Management. There is also a single CIO representing the enterprise and all of it bureaus. At State, the critical members of the senior management team look over the horizon to the long-term needs of the entire enterprise and not just current information technology (IT) projects. This longer view encourages validation of need and follow-on or changing requirements.

State also said that strategic IT planning documents have been developed that relate back to the strategic plans for international affairs and for the mission of the department. With these guidance documents in place, the planning for information technology is well grounded and long-term goals and objectives have been promulgated by the CIO and the Under Secretary for Management. This planning is now showing up in the improving maturity of the capital planning process.

For the Defense Information Systems Agency (DISA), their strategic plan covers seven years, which includes the two current years plus the budget year forward. A central component to this planning process is their forward look at technology. DISA tries to anticipate technology and technological trends. They do this for two reasons: First, they use this analysis to set long-term goals; second, they want to take advantage of new and emerging technologies.

As DISA progresses through their CPIC process, they use their strategic work as a foundation or precomponent in their “Select-Control-Evaluate” activities. DISA prefers to do mission impact analysis as a “preselect” phase.

This same “preselect” analysis and decision point is also found at the Department of Agriculture. USDA revised its process for FY 2000 to include an early decision phase, after determining that its original three phases (Select-Control-Evaluate) did not provide for preliminary work on business case and strategic linkage that must be accomplished prior to more detailed analysis, like cost benefit analysis and risk assessment.

Business Focus

Technology should emphasize business value and solutions rather than technical sophistication. Although technology may drive changes in business processes, it is important that these changes are prioritized because of the benefits they bring to a process, not simply because they are technically attractive.

Additionally, deploying technology for its own sake is not an effective use of resources. Many organizations have learned this lesson the hard way – by implementing systems that sounded good in theory, but delivered no clear benefit to their business community. To use IT effectively, IT organizations must partner with business lines to ensure that business objectives and requirements drive architecture and technology investments. Many of the participants in the interviews described "smart practices" in this area.

According to the Department of State's CIO, several events helped that agency, particularly the program executives, understand the value of IT. The first event was Y2K. It forced the various organizations, particularly the Assistant Secretaries, to work together and meet on a regular basis. Through this process, key relationships were built. Also, the group had a better understanding of the IT inventories, and, as he said, ultimately understood the importance of IT to the agency's operations. The second event – or more specifically, activity – was their development of a comprehensive suite of IT strategic and tactical plans tied to the department's corporate strategic plans. The process State used to develop these plans required the involvement and sign-off by all stakeholders.

At USDA, the key to business-driven capital planning is clear: good capital planning requires the CIO to work cooperatively with program executives. USDA's success has been built on an effective relationship between the CIO and the Deputy Under and Assistant Secretaries responsible for USDA's many programs. The CIO was able to build on that group's interest in assuring that IT investments were well managed and clearly tied to business needs. USDA has also found that key IT focus areas can become more important as business needs change. USDA's Deputy CIO stated, "At USDA, the goal is to build on each success and to modify our processes as we learn what is effective for the department. Most recently, our program executives recognized the need for strong security and efficient telecommunications to meet a growing business need for 'e-government.' Our process has evolved to meet this need."

At the Department of Education, the CIO offered this advice: "Don't speak in technical terms, otherwise you risk being misunderstood. Emphasize business implications." This thought was seconded by the Department of Labor's Deputy CIO.

There is a strong link from this section to the sections on capital planning and technology later in this document. Those firms that have an enterprise architecture with a rigorous strategic planning process had an easier time tying actual investments to the business, as they are required to utilize that process as part of the business cases long before a decision on IT is considered.

In fact, several of the private firms stated that if the investment is not directly tied to a business goal, it is never seriously considered as viable. The Federal agencies also report strengthening this decision point as part of their EA and CPIC processes.

Leadership

Federal agency and private company Executives are responsible for ensuring that the agency achieves its mission. To achieve desired results, Executives must mobilize staff, manage resources, engage constituencies and customers, supervise work operations and oversee an array of management processes. Among company executives, the Chief Information Officer (CIO) and Chief Financial Officer (CFO) hold important responsibilities for ensuring that the agency effectively uses IT. Their responsibilities converge in a number of areas, such as IT capital planning, financial transaction processing and human resource management. Complex converging leadership responsibilities make it particularly critical for agency executives to communicate and cooperate effectively.

Through the Clinger-Cohen Act, leadership for a Federal agency's capital planning process is vested in the CIO. However, others have responsibility for related areas: the CFO for GPRA and financial systems, the Chief Procurement Executive for FASA V requirements, and, of course, program executives for delivery of agencies' mission programs. One of the many challenges faced by organizations seeking to establish or improve CPIC processes, then, is how to get all interested parties moving in the same direction. Clearly, this requires vision and leadership from the CIO. Virtually every Executive interviewed talked about the need for Executive support.

At HUD, the Deputy Secretary is a key supporter of IT Capital Planning and Investment Control. According to the CIO at HUD, "We have buy-in from the top of the organization." HUD also had a desire to change the process, which drove them to move forward in capital planning.

At USDA, similar Executive support was noted. The CIO and Deputy CIO, building on support at the top of the organization, have worked to keep their eyes on the vision while remaining flexible about the details of the process. The Deputy CIO characterizes it this way: "The CIO must be the 'honest broker' in an effective capital planning process. It is not up to us to mandate every decision that comes from the CPIC process. Our role is to ensure the process is used, that all investments come through the process and that the process is meeting the needs of our business community." Keeping that vision in mind, USDA will continuously modify its process to ensure that it meets evolving business requirements.

While Booz·Allen & Hamilton's CIO guides the IT capital planing process, overall leadership is exercised jointly by the CIO and an IT panel consisting of senior representatives from its various business units. This joint leadership means that the units' mission requirements are a central focus of all IT investment planning. It also means that implementation considerations are a key topic as potential IT investments are reviewed.

Additionally, at RS Information Systems, Inc. (RSIS), all directors are required to assess, maintain and develop IT requirements and manage the IT portfolios. These directors are then evaluated and rewarded on the "success" of their requirements. "Success" is measured by overall performance that includes timeliness, budget and client satisfaction metrics.

At EDS, the CIO is responsible for aligning EDS' internal use of IT with its business objectives and transformation activities. EDS is undergoing tremendous change in its business architecture, processes and the portfolio of services performed for clients. According to EDS, this transformation requires equally significant changes in their systems and technology. The Office of the CIO at EDS is assuring that EDS' internal use of IT: 1) Is responsive to EDS' business needs; 2) Improves the company's leverage, productivity and competitive advantage; and 3) Achieves corporate and business unit strategies.

Education reports that the vision and leadership for capital planning is seen as a two-step process. First, the CIO must "position the change" (which consists of 90 percent cultural migration and 10 percent technical migration). The next challenge is to "deliver the change and grasp their imagination." As to how this is actually done, the CIO's advice is simple: "Get good people to lead the effort."

Good people are a key building block for solid capital planning. USDA's Deputy CIO noted that "recruiting and retaining talented people with the skills necessary for capital planning, as well as other critical IT ventures, is one of our main challenges in IT today." The Deputy CIO went on to say, "To maintain an IT workforce that will allow us to accomplish our goals requires that we be flexible in how we accomplish our work, keep the needs of our workforce in mind, and use the tools available to us to attract, reward and train the people we have."

Attracting and retaining the right people with the rights skills was cited by almost every company we interviewed. And almost everyone agrees that industry (private and public) has work to do in this area. Private industry does seem to have a jump on this process, with EDS, SOZA and RSIS specifically identifying management processes that incentivize and reward employees in this area.

Department of Labor spoke of the need to focus your vision to serve the needs of two communities: political and career Executives. Labor's Deputy CIO noted a difference in time horizon and, consequently, a difference in goals among career versus political executives. There, the CIO and Deputy CIO worked extensively to show both groups the benefit *to them* in using capital planning. "Once key players understand the benefits, working out the details is feasible," stated the Deputy CIO.

Also, at Department of Labor, the CIO took a broad view of the work that needed to be accomplished and allowed a subgroup of agency executives and staff to determine how investment management would work at DOL. The Clinger-Cohen and OMB requirements were given to the group, which developed the processes and procedures specific to DOL. This allowed them flexibility and caused them to buy in to the process they had developed *themselves*.

Sometimes, an agency can build upon a convergence of events to improve capital planning. According to State's CIO, getting CFO and Procurement Executive support was facilitated by the fact that all of them (CIO, CFO, and CPO) came in about the same time. Each had a similar outlook on how to improve things. State's CIO said that they were all on the "same sheet of music" from the outset and were familiar with the requirements for effective capital planning and understood the intentions of the Congress and GAO to improve this critical area.

RSIS, a company started by entrepreneurs, believes it is important to pass on the entrepreneurial feeling to your employees. The more your employees feel that they are contributing to a common goal and are rewarded for their input and performance, the more they will work to identify better ways of doing business. RSIS sees this process through to completion in that each employee in the company is measured and incentivized to make sure their jobs are both rewarding to the company and the employee. Yearly performance goals are measured for each employee, which include incentives for innovative solutions matched with reduction in corporate expenditures.

Capital Planning

Capital planning is a collective decision-making process for ensuring that IT investments integrate strategic planning, budgeting, procurement and the management of IT in support of agency or company business objectives. Effective capital planning requires long-range planning and a disciplined budget process as the basis for managing a portfolio of assets to achieve performance goals and objectives with minimal risks, lowest life-cycle costs and greatest benefits to the business.

Organizations with successful capital planning and investment control processes also report a strong investment review board (IRB) as a mandatory part of the CPIC process. It is clear that organizations that are successful in their processes have IT portfolios that support the business objectives and goals and that the business organizations are an integral part of any project from initial concept and remain involved as part of the integrated project team throughout the life cycle of the project. Successful capital planning processes also use a very specific and repeatable set of criteria for selection and continuation of projects. These criteria, at a minimum, include benefits, risks and costs associated with each investment.

The strongest CPIC processes are found in companies and agencies that understand that the decision-making process is divided into two different reviews: 1) How is the project performing toward costs, schedule and performance goals? and 2) How much of the available budget should be allocated to this project for the current cycle? This is extremely important, because once a milestone is reached successfully, the financial measures reveal only a small part of the answer to the question "How is this project performing? In most cases, this financial measure is an outcome and tells nothing of the future performance of the project or its likelihood of success. One way to empower these financial measures so that more information is available is to use a performance-based management system such as Earned Value Management System (EVMS). EVMS allows reporting and earning value as it is achieved using the project plan and a work breakdown structure to manage and report the information.

One particular smart practice repeated in every leading organization was that the CIO, CFO, CPO and senior management from the business lines were part of the integrated CPIC process. The Department of Housing and Urban Development has a "triumvirate" at the top of its capital planning process. That is, there is a close partnership among the Chief Information Officer, Chief Financial Officer and Procurement Executive. The Assistant Secretary for Administration is also onboard. At HUD, a vehicle, the Technology Investment Board (TIB) is in place to allow capital planning functions to take place, and a working group from the program areas is included. HUD's current capital planning process is built around these groups. The Deputy Secretary participates, and projects receive no money if they do not successfully complete control reviews.

HUD's Deputy CIO for IT Reform has noted the following key practice: "Use oversight to your advantage." The agency has leveraged unfavorable audit reports to involve executives in its capital planning process and to obtain resources for improvement. They have worked to make executives understand what the benefit is for *them*.

The key players at Department of State are the CIO, CFO and Head Procurement Official. At State, this group meets on a weekly basis, "works very closely" and has a "great relationship," as the Chief Information Officer of the Department of State said. Some of their responsibilities, as defined by their capital planning process, are to 1) approve the IT Program Board, which is chaired by the Under Secretary for Management, and 2) resolve differences between two lower-level advisory groups – the Management Review Advisory Group (MRAG) and the Technical Review Advisory Group (TRAG). These groups review projects from a business and technical oversight standpoint and provide independent review for top management.

As part of their comprehensive CPIC process, the Department of State manages and monitors projects on a regular basis against detailed tactical plan milestones as well as a series of performance (outcome and output) measures. With respect to performance measures, State documents the measurement process and frequency, as well as the date to be accomplished. Of course, State also tracks projects planned versus actual project costs. State uses a standard briefing template for investment review that addresses 18 common elements.

At the Department of Labor, the key players are the CIO, CFO and Head Procurement Official, as well as the Budget Officer, who also has responsibility for the Government Performance and Results Act. Labor has a structured capital planning process that includes executives throughout the organization. A Management Review Council includes the Deputy Secretary, Assistant Secretaries, the CIO and CFO. The Technical Review Board, chaired by the CIO, includes the Administrative Officers and IRM Managers from agencies as well as a business and technical representative from the small organizational units. The Inspector General also participates in this group. Supporting those groups are a Capital Planning (CP) Subcommittee and an Information Technology Architecture Subcommittee. The CP Subcommittee includes Budget Officers, CIO representatives, agency program officers, CIO support staff and a representative from the OIG. That group was charged with developing the rules for CPIC at Labor, given the legislative framework in which we all work. The ITA Subgroup includes the Chief Architect (from the CIO staff), agency architects, computer and telecommunications specialists, network engineers and other technical analysts. Each group has documented responsibilities and approval authorities, allowing them to work together effectively.

USDA's key players are the CIO and the Program Executives. USDA has a board, the Executive Information Technology Investment Review Board (EITIRB), that is responsible for management of IT investments and approval of the portfolio of IT investments. The EITIRB is chaired by the Deputy Secretary, with the CIO serving as the vice chair. Each Under Secretary and Assistant Secretary is a member, as well as the Budget Officer and the CFO. This group is supported by the Deputy Under and Assistant Secretaries as well as the Deputy CIO and CFO, who constitute the Deputies' Capital Planning Working Group.

USDA uses I-TIPS, the Information Technology Investment Portfolio System, to support its capital planning process. I-TIPS is supported by a scoring process that addresses mission, risk, ROI, cost, schedule and performance as well as architecture and security. Secretarial priorities are also factored into USDA scoring. Investments receive rigorous review by Program and Administrative Executives and their staffs. The review involves financial, budget, program and IT staff, so that there is a balanced view. DOL also uses I-TIPS to support its capital planning process. I-TIPS helps the department to score, rank and prioritize its IT investments. A rigorous review cycle also contributes to effective allocation of resources. Labor uses three capital planning cycles each year: a general call; a second level of screening, which is presented to the Deputy Secretary; and a third call to respond to questions on investments.

There are over 20 agencies in the Federal government that report using I-TIPS as a tool to implement their CPIC processes. Eleven of these agencies participate in a government-wide service level agreement (SLA) whereby the tool is funded, managed and developed. This is the only cross-government SLA that addresses not only a tool but rather the processes embedded in the tool. There is a more detailed discussion of this tool in the section on tools and techniques.

While tools are a great way to invite everyone to participate, RSIS reminds us that the process must be in place before the tool can have any impact. RSIS cautions that they have found that careful planning and avoiding knee-jerk reactions to changes in IT advancement helps ensure that the IT infrastructure of an organization is able to grow and advance technically in an ever changing IT landscape. Identified requirements matched with innovative solutions assists organizations in securing an IT baseline. The only constant in IT is change. Realizing that technology refresh is required in a timely manner and incorporating this refresh into a justifiable CPIC will help any organization.

RSIS' process includes everyone in the company and everyone holds responsibility for the CPIC process. RSIS says that includes the identification of new system requirements by individual employees, whose ultimate goal is to please the customer. These requirements are then passed on to the MIS Director for incorporation into the organizational yearly budget. After close examination, these requirements are priced and included in the capital portion of the corporate budget, which is maintained by the Controller. After discussion with the MIS Director and other Division Directors, this budget is then passed on to the President of the company for approval.

Booz.Allen seems to have arrived at a solution for an issue with which Federal agencies are wrestling. That is, how Federal agencies should address those infrastructure and corporate-type projects that must be funded in order for the mission and business area projects to function. The CPIC process at most Federal agencies has the mission area projects competing for the same resources of the infrastructure "must haves." Capital planning at Booz·Allen includes the classification of projects as "nondiscretionary" and "discretionary." Nondiscretionary projects are those that must be funded to allow the core mission of the organization to be performed. Discretionary projects are those that would enhance performance and better position the organization to meet evolving needs. Different types of justification and review are employed prior to funding approval. For example, cost-effectiveness is a key focus for non-discretionary projects, while business cases are utilized for planning, review and approval of discretionary projects.

EDS reports that the business drives most of the decisions on internal IT projects and they must be justified through a business case process at EDS. The business cases analysis is aligned with corporate and business unit strategies. Depending on the size of the project, approval must be given by the appropriate business unit leaders and the Office of the CIO to ensure risks, rewards and strategies are aligned.

The business cases analysis scenario at EDS includes an executive summary that is short in length and financially focused, covering strategic justification, deliverables, implementation costs, payback and investment rate of return and differential costs analysis.

The details required in the EDS process are:

Project type – This is the basic framework for justification. A brief paragraph frames the nature of the project (i.e., strategic, efficiency, legal, etc.).

Project background – Brief history of events, inefficiencies or business factors leading up to the present time. For existing systems, the statement should include a brief history of the system origin, function and major milestones.

Current situation and critical factor discussion – This section should address the current status of the business issue/opportunity and the impact to the organization (from a cost or opportunity perspective) that implementation of the project would provide. This section should also discuss any legal requirements motivating the project. The risk of *not* doing the project should be documented. Examples include but are not limited to: not becoming Capability Maturity Model (CMM) Level 2 certified; continuing to incur higher costs; being unable to operate system; being incompatible with another planned system change, etc.

Recommended solution discussion – This section should include the following:

- ***Strategic elements***: Provides the linkage to business and corporate strategy. Discusses project impact to achievement of goals.
- ***Scope***: Covers implementation boundaries – which groups, systems and businesses will be affected. Linkages to other projects must also be declared to ensure that all project elements are submitted together as one total project.
- ***Process re-engineering***: Examines the overall business process (beginning to end) to be improved or enabled by the project including elements indirectly affected. This ensures the complete solution is considered rather than a point solution, which may be an inefficient or ineffective step in a non-optimal business process.
- ***Workforce restructuring:*** Some process changes may require realignment of people resources. If the impact were sufficiently large, one methodology would be to review the new process and, while disregarding the current workforce number and structure, calculate the required structure and amount of people to staff the outcome.
- ***Infrastructure requirements***: These are elements required to support the project outcome that are not directly associated with the project. Examples include but are not limited to: interface with other systems; increased drive space or processing ability; increased memory and hard drive capacities on desktop or portable computers; additional production support; increased communication/bandwidth, etc.

- ***Risk analysis:*** This is a discussion of the inherent risks of the project, including the contingency plans.
- ***Critical path:*** This outlines those items which, when delayed, will cause a direct and equivalent delay in the overall completion of the project. This frames the key enablers of the project to ensure the critical support elements are available. This section should also include a summary of major milestones.
- ***Success metrics***: Identifies the elements or conditions that will be used to consider the project a success. These items should be clear, measurable and have dates. Examples include but are not limited to cost savings, increased revenue, headcount reduction, increased performance, decreased downtime, etc.

Enterprise system impact – If the solution is supplemental to SAP R/3 and justified with the SAP Program Office, the requirements to link and maintain this system/program/modification with SAP must be detailed. If a project requires a system interface with SAP, it must be a "certified bolt-on" with certification coming from SAP. The SAP Program Office must approve any system that has to link with SAP or has similar functionality before any other approvals are solicited.

Alternatives considered – This section would address other considered solutions.

Financial evaluation with three-year cost analysis – The primary focus of the financial analysis should be payback period and internal rate of return. The tool used to accomplish this is available on the cio.gov Web site. This document should be completed accompanied by major assumptions and appropriate supporting detail. The cost and benefit analysis is limited to three years (from the point the system goes into production) to align with the corporate planning horizon.

For systems that are replacing or modifying older systems, a differential cost analysis should be performed and financial templates filled out even if some of the financial indicators cannot be calculated.

For leased equipment, reflect timing of lease expenditures as expenses. For hardware, either the NPV of the lease or the cost to purchase needs to be included in the implementation cost.

Intangible benefits – These are the soft benefits of doing the project. Examples include but are not limited to: best practice, paperless environment, leading edge technology, customer partnering, etc.

Attachments (to be attached to the business case for the approval process) – "Statement of Work" or equivalent documents concerning agreed changes or deliverables; "Business Partner Agreement" or equivalent schedule of agreed technical costs to be billed; and the Project Management Plan. Length and detail of the business case should be commensurate with the scope, complexity, length and cost of project.

Approval Matrix – EDS' guidance is that, when initiating a system project, an organization should answer the following questions:

1. Does the project affect multiple strategic units' processes and / or systems?
2. Does the project significantly affect EDS' IT strategy?
3. Will the project require any external (non-EDS) technical expertise?
4. Will any external software be purchased?

If the answer to any of these questions is "yes," a minimum of Threshold 2 applies, regardless of cost. (See threshold descriptions below.) Of course, if the estimated cost is over $500K, Threshold 3 applies.

Total Dollar Amount Thresholds and Signatures Required
Threshold 1: Under $50K – No business case write-up required. Approval required:

1. System Owner
2. Budget Owner

Threshold 2: $50K and over, but under $500K – Business case write-up required.
Approval required:

3. Regional TESC Manager
4. Global SAP Project Office
5. Strategic Unit Controller
6. Strategic Unit Leader

Threshold 3: $500K and over - Business case write-up required. Approval required:

7. Strategic Unit Senior Executive (reports to EDS COO)
8. Director – TESC
9. Corporate Controller
10. EDS CIO

SOZA comments that they have found, in order to ensure the full and seamless integration of any changes resulting from IT expenditures, an Architecture Review Board (ARB) must be formed. The ARB must be integrated into the CPIC process. It will review all capital investment requests and perform a configuration assurance (CA) review. The CA review ensures all possible ramifications of a new IT purchase have been considered and planned for in all other elements of the enterprise, e.g., business processes, data architecture, infrastructure architecture and applications architecture.

The Department of Education reports that communication is extremely important to the success of their processes and meetings are held three times a week with key players to discuss the issues at hand, which cover a broad spectrum. Beginning emphasis is on information management (IM) instead of information technology (IT) because it is a larger component of Education's enterprise.

HUD has identified another smart practice related to investment control. Don't stop projects simply to stop them, or give the impression that you are. Use control reviews to slow down investments until they can be successful.

A number of agencies pointed out that "best practices" or "smart practices" cannot simply be cut and pasted into another organization, as no two organizations are the same. It became a smart or best practice in the original organization because someone took the time to ensure it represented his or her business process. Another failure of best or smart practices was that, while there were any number of documents called best and/or smart, few had been validated as successful. The practice of using untried and unvalidated processes has in some cases led to "bad practices" rather than best practices. A repeated caution from organizations is, "No one knows your business like you do." Create a process that meets your business needs using ideas and suggestions from others with like-minded goals.

And along this same line of thought, RSIS reports that, in realizing tremendous growth over the past eight years, it has implemented an approach to capital planning and IT management that is evolving over time and is flexible enough to adjust as necessary to meet the customer's needs. RSIS has benefited in that, as a young company, the process of planning for and implementing smart practices is not written in stone. In the ever-changing world of IT, it can be beneficial to an organization the size of RSIS to keep processes and procedures flexible enough to support this ever-changing world.

Federal agencies have been working on these issues for several years, and all of the Federal efforts to address these capital planning and enterprise architecture issues have been team efforts with private industry. The Federal CIO Council's "ROI and the Value Puzzle," dated January 1999, attempted to help agencies as they grappled with planning and documenting the value of IT investments. While this document represented a strong first effort, agencies report continuing areas of weakness in establishing the value and the skills needed to support areas for capital planning, including risk assessment, which has traditionally been viewed as a security issue; ROI methods; performance measurement; benefits and costs analysis; adjusted rates of return; and planning for the sustainability of the investments after deployment.

OMB cautions that we must change our way of thinking about IT systems and portfolios if we ever expect to achieve true success. What do we mean by this? Think of this. Urban planners and community planners have for a long time included the sustainability of assets once they are in place and how this affects the overall system of homes and businesses included in the community. The IT community is just beginning to understand that our IT portfolios are a community of systems that interact and interoperate and affect one another and that a majority of these systems and projects depend upon a shared infrastructure. Each project or investment has specific issues and requirements, and in most cases there are also infrastructure and enterprise issues that are affected by the project. Many projects planned today represent "pie in the sky" best-case scenario cost estimates, do not have a clear performance strategy and fail miserably in planning for sustainability. If all significant projects are required to identify cost, schedule and performance goals, and achieve ninety percent of them as required by FASA, we must begin to do a better job of planning and executing the capital asset plans. The partnering of our CPIC and EA processes and their interactions are driving a great deal of conversation in this arena and greater success in the management of IT and our business processes.

The following is a compilation of suggestions and questions to guide your thinking once an idea forms, your business changes, or a policy or piece of legislation identifies a performance need or gap:

As part of the initial concept – What is the business need or the performance gap you are attempting to close? How did you define the performance gap? Does your agency have a basis to detect and determine the size and scope of the performance gap (such as a strategic plan, performance plan, business plan, or enterprise architecture)? Were these plans created using customers, stakeholders, providers and members of an integrated project team (CFO, CIO, CPO, Program, EA, etc.)? Can you close the performance gap without IT (BPR, etc.)? If IT is required, proceed to the questions in the detailed analysis section.

For more detailed analysis – Did you perform a needs analysis? Have you baselined the project's performance (description of what you are able to accomplish today)? Did you perform a functional requirements analysis? (This will indicate what needs to be achieved to close the gap and should include all impacted parties.)

Are you ready for planning and measurement? Do you have a project plan? (Present project-specific goals and milestones, as well as links to functional requirements that must be met to address the performance gap.) Have you completed a benefit/cost analysis? Have you identified the options for closing the performance gap with this investment? (Discuss methodology used to determine the options, such as scenario planning and alternatives analysis.) Did you perform market research and a feasibility analysis?

Have you conducted a risk assessment (including strategic, technological, enterprise architecture, security, privacy, Section 508, etc.) to identify additional measures? Do you have a plan to mitigate and manage any of the risks? Does your project plan include a work breakdown structure (WBS) and assign values to the costs and schedules in the WBS? Do you have a preliminary acquisition plan or strategy (also identifies measures and gaps)?

All of these measures should come together in a Quality and Assurance Plan. (One should be able to identify from the plan at least two technology measures, at least two strategic measures, at least two acquisition type measures, and at least two customer impact measures.) Can you use all of these measures to articulate how you will close the original gap identified in the needs analysis or legislation-driven need? Are all of the trigger points in the documents and analysis identified and managed through the control phase?

Did it work? (Describe the extent to which the gap was addressed and the final cost; also, describe any additional actions that must be taken.) Did you achieve the planned customer impact? Do they think it was a success? Can you articulate how you did it? Do you know enough and is it documented well enough to repeat the success? Is there anything about the capital planning process or enterprise architecture that should be changed to enable even greater success? While addressing these individual questions cannot ensure success, it will ensure that some of the most problematic issues are part of your capital planning and investment control for the projects.

CPIC is an extremely important issue for the Federal government and there are currently a number of Federal councils involved in the Capital Planning and Investment Control Process: the Procurement Executive Council (acquisition); a CFO Council with its Budget Officer's Advisory Council (BOAC); the CIO Council, including the Federal Agency Information Architecture Working Group (enterprise architecture). All of the councils have counterpart committees that need to communicate with others and collaborate. Capital Planning and Investment Control can serve as the focal point for collaboration and for developing requirements to improve and better integrate the process.

The Federal Agency Information Architecture Work Group (FAIAWG) of the Federal CIO's Council issued a Federal Enterprise Architecture Framework (FEAF), dated September 1999. The FEAF provides guidance for developing, maintaining and facilitating EAs in the Federal government. The framework serves as a reference point to facilitate the efficient and effective coordination of common business processes, data sharing and investments among and between Federal agencies.

The FAIAWG and the Capital Planning and IT Management Committee, along with GAO, have partnered on several projects this year to strengthen the participation and interaction of the CPIC and EA processes in the agencies. Two additional documents on these topics are scheduled for release from the FAIAWG in October 2000, an Architecture Alignment Guide and a Practical Guide for Developing an Enterprise Architecture. This EA practical guide will be the first time the Federal government has described the EA and CPIC processes working together to form an agency's governance of IT Investments and how the processes support one another.

Project Management

Project management is used to describe an organizational approach to the management of projects. It is also the application of knowledge, skills, tools and techniques to plan activities to reach or exceed an expected outcome. Project management includes planning and implementing projects within a designated cost and schedule and at a desired performance and technology level better known as scope, time, cost and quality. Good project management includes involvement and coordination with the customer to reach mutually agreeable decisions about IT. It also includes a work breakdown structure and a project management team that remains on the project throughout its life cycle. The practice of project management can focus efforts on the agency mission by aligning project priorities, leveraging resources and delivering services and products to customers. In order to achieve the real benefit of managing a project and utilizing a project management tool, it is necessary to obtain the proper training and certification.

A consistent theme in both private and Federal organizations is that you can have the best-planned, best-risk-managed and best-funded project, but unless the project manager is qualified and empowered, the chance of success is minimal. OMB reminds us that if an agency does not have qualified project managers, then this risk must be identified and managed as part of the systems risk assessments and plans. Further, OMB goes on to say that this identified risk should also be part of the life-cycle costs formulated for the project. This is what is called risk-adjusted life cycle costs.

HUD identified this project manager issue as an overall concern, and the Chief Information Officer and Deputy Chief Information Officer both view project management as a *critical practice* for successful IT capital planning. Project management training is necessary for IT Program and Project Managers, and HUD has embarked on an ambitious training program in this area. The objective of the IT Investment and Project Management Training and Certification Program is to provide IT Program and Project Managers with practical guidance and tools to support the following:

- IT project initiation (how to bring an IT project forward)
- Justification (how to make a business case)
- Management and control (how to ensure that a project remains viable)
- Project closeout (how to conduct a postimplementation evaluation and identify and leverage "lessons learned)

The overall strategy for developing the training is to integrate best practices in IT investment management, project management instructional design, and industry-recognized best practices to provide HUD with an innovative yet tailored training program. Project managers will apply the methodologies and tools in real time to real projects.

HUD investments are funded through a working capital fund. The health of each project is assessed through quarterly investment control reviews. Funds may be reallocated among projects that need to be accelerated or redirected.

The U.S. Department of Labor Deputy Chief Information Officer strongly agrees that rigorous project management is a necessity for successful capital planning. She feels there is a problem with the depth and breadth of understanding of project management tenets and techniques. To help remedy this, Labor uses an adaptation of the Project Management Institute model for project management.

According to the CIO at State, his department also needed to maintain and nurture IT management skills in several areas to meet the challenge of the tremendous changes in Information Technology and how it impacts the State Department mission. First, the need for planning skills is paramount to develop a visionary blueprint for the future, matching IT capabilities to the needs of our foreign policy requirements. Second, the need for project management skills is critical to effectively implement the plans that are funded through the capital planning process.

To help understand long-term needs, State seeks to understand the "tail" of each project. It is one thing to approve a project measured against risk factors, specific benefits, ROI, impacts on the business, etc., but it is another thing to truly understand the long-term costs and ramifications of the project. State has developed a very simple form, the completion of which is required for all projects. The form documents all prior-year funding (all sources), current-year funding (by quarter), estimates for the next two fiscal years and an estimate of the out-years.

At U.S. Customs, project management begins with a defined process contained in the Customs Investment Management Process (IMP). The IMP defines management controls that must be in place, i.e., performance measures, costs and schedules, before a project can begin. The correct front-loading of all project data is critical to any measurement that occurs in the project development stage (Control). Project Managers attend a four-day project management seminar centered on information technology project management techniques. Customs is also developing training in Earned Value Management (EVM), which will be implemented for all project tracking and reporting. Prior to project development, each project undergoes a comprehensive project initiation process. Project initiation is conducted by members of the OIT Planning Group, Project Monitoring Group, Technology Architecture Group and Business Interface Representative, who make up the Project Initiation Team. Customs has implemented a System Development Life Cycle (SDLC) process that provides guidelines for the process. As an adjunct to project oversight, Customs' CIO has established a Project Monitoring Group, which supports the reporting of all project progress, to include input into the Customs Investment Review Board.

The Department of Education CIO is also a strong proponent of rigorous and thorough project management. As a former CIO of NAVAIR, the CIO has strong ties with the Department oft the Navy and has begun to initiate some of their project management methodologies at Education. Additionally, he has begun Earned Value Project Management training so that projects can be controlled more effectively and negative variances mitigated.

There was strong agreement on the need for project management skills, yet there was considerable variation in how to define a project. The definitions of a project used in the CPIC processes are as varied as the enterprises that participated in this effort. The Federal government allows an agency's capital planning and business processes to determine the definition of a project, while EDS' definition for a project is any effort that has a plan and deliverables; is constrained by schedule commitments, resource requirements, and budget limitations; and can be delineated from other concurrent activities.

Several Federal agencies and private companies caution against thinking that project management for IT is the same as managing a project to create a building or structure. The disciplines have some things in common, yet their differences could fill volumes. The disciplines for construction are quite different, have an end-life, and do not change at the rate of IT. While all of these assets are required to operate in existing systems or processes, only IT requires constant communication between all of the other elements. In many cases, projects for things like construction, and planes begin with a blank slate with no existing information technology infrastructure in which it must create synergy. Once automobiles are complete, they may travel the same roads and highways but are not required to electronically communicate as they travel. However, most of the projects in the IT community must be managed to successfully integrate with an existing technological infrastructure and operating network of systems – and do it seamlessly without degradation to other projects on the network.

There have been many analogies written to describe what managing and EA and IT is like. In order to start the thinking process in this area, imagine an Amtrak train travelling between New York and Washington, DC. Most of us have taken this ride, so we know how fast the train travels. Imagine that without slowing the train, or creating any additional costs or delaying the schedule, you must plan and execute the insertion of a passenger car between two existing cars as the train continues its trip. The logistics and strategy required is mind boggling, don't you think?

As enormous an undertaking as this sounds, many of our IT investments exist in networks of systems driven by the new economy whose main staple is IT enabling business while managing the bottom line and ensuring the continuation of existing delivery of benefits.

Performance Management

In the world of capital planning and investment control, two things are very important: managing the projects for success and monitoring the performance measures and goals. Most companies and agencies use a two-sided approach, financial and nonfinancial. It is commonly understood that financial measures are usually outcomes of processes while nonfinancial measures address relationships between projects or processes and what is actually happening behind the scenes. Agencies have discovered that it is infinitely easier to manage and control complex systems when there are performance measures, as "what gets measured is what gets managed and improved."

Several of the Federal agencies report to having gained a great deal of insight from processes such as the Service Quality Indicator (SQI) at Federal Express. Federal Express has developed a corporate-wide performance measurement system called the SQI. SQI includes financial, nonfinancial, and customer service criteria and measures that are weighted for importance by the customer. SQI consists of 12 key service and operations areas. This information is collected and reviewed by the Federal Express management team daily and an average score is computed and posted company-wide weekly. There must be something to this process – ask yourself if you were satisfied the last time you used Federal Express. Federal Express understood that a great deal of information and process improvement can be gained by nonfinancial measures.

One of the realities of a CPIC process is that the only constant is change – organizations may receive smaller budgets, requirements may be changed, or even contract awards get delayed. Just one of these events may affect the ability of a project or even an organization to meet project milestones or more importantly produce promised results. Strong organizations have strong performance management activities and processes in place.

The realities described above are best dealt with through an "effective capital planning process that requires the ability to negotiate and be flexible," according to HUD's CIO. HUD realizes that legitimate changes to the portfolio can occur "off cycle." At HUD, the CIO said that this is recognized, and, in fact, planned for. There are four opportunities for reprogramming investment dollars. Any occurrence outside of this requires the approval of the Deputy Secretary.

HUD has also learned to separate program management decisions from budget decisions. The management decision comes first – is a project healthy? Is it meeting its goals? Only after that determination is made does a budget decision occur. This takes away some resistance to the capital planning process.

At Labor, they use project management and integrated project teams to bring projects to successful implementation. Budget crosscuts are used to create strategic direction, while tactical plans are developed for implementation. These are used to ensure that programs and projects are executed according to plan.

According to the Department of State, the funding resources needed to satisfy global requirements have been very limited amid the uncertainties of the annual funding process (i.e., continuing resolutions, etc.). They must make wise resource allocations that are critical to the survival of many needed projects across the enterprise. State said that many projects are kept alive on a minimal funding basis in order to get the most out of scarce resources. This requires a careful and continuing evaluation process to support the timely allocation of needed resources.

As part of this process, State currently uses a series of evaluation checklists, scoring worksheets and check sheets to provide the information needed to make a decision. One interesting comment made by State with respect to the scoring worksheets was that they do not provide weights for the criteria. They said that this helps limit the "gaming" of the process by the projects. This focuses projects toward honest and accurate scores, for which a final weighted score can later be applied. State also said that *all* projects, regardless of funding source, must be scored.

One path to ensuring that performance management is in place is to make this requirement part of an agency's annual appropriation language. At USDA, their appropriation language requires Executive Information Technology Investment Review Board (EITIRB) approval of investments. The EITIRB has established a subcommittee, the Deputies Capital Planning Working Group (DCPWG), to manage investments at USDA. The DCPWG, motivated by a desire to ensure funds were well spent, takes an active role in reviewing and scoring major investments as well as following up on program management issues. Through the scoring process, the DCPWG looks closely at the project's performance versus established goals that include cost, schedule and mission effectiveness.

Technology (Acquisition and Architecture)

By now you have realized this guide is written with a specific eye to the IT community, though no part of this heading is restricted to IT. Acquisition is not synonymous with procurement but rather procurement is a part of acquisition. Acquisition is not limited to IT and, as we have learned in the IT arena over the last several years, there are very few capital planning and investment control tools, ideas and techniques whose viability is limited to IT.

Enterprise architecture is defined as a set of business processes, applications, data descriptions, technical infrastructures, information flows and relationships designed to integrate an agency's business with its processes, goals and acquisitions. And as is evident, EA also is not limited to IT.

The agency's strategic objectives drive its IT acquisition practices. That seems to be a really emphatic statement – but is it true? In plain English, we have a finite amount of money (Budget Enforcement Act, and Balanced Budget Amendment); must focus on agency mission, strategic goals and outcomes (Government Performance and Results Act); plan and make strategic decisions about fiscal investments (Paperwork Reduction Act) to get the biggest bang for the buck (Clinger-Cohen Act); and then deliver on our commitment (Federal Acquisition Streamlining Act, Title V). To develop, implement and maintain effective systems and services, acquisition and procurement practices must translate into clearly defined requirements and then eventually to successful deliverables.

During OMB's review of capital planning processes among Federal agencies, there seemed to be a tendency to create wonderfully detailed acquisition and procurement plans that provided for almost every contingency and then choose a contract vehicle that required the Federal government to assume all of the risks. If through our CPIC processes we have identified all of the risks, created plans to mitigate and manage these risks, and ensured that we have the acquisition and procurement skills to manage them, then the question to ask would be, what true risks are there to the government, and choose appropriately.

EDS has established a corporate technology policy for managing IT which includes these guiding principles:

- **Portability** – Software will operate on various platforms regardless of the manufacturer or operating system.
- **Flexibility** – An application will have the capability to take advantage of new technologies and can be implemented in changing environments. Flexibility contributes to better performance and lower overall costs by facilitating software and hardware procurement from multiple sources.
- **Interoperability** – Applications and computers from different suppliers will work together on a network and will connect and share data and processes as appropriate.
- **Scalability** — Applications will migrate as a client or server to machines of greater or lesser power, depending on the requirements, with little or no change to the underlying components.
- **Usability** – Applications will be easy to use; they will enhance and support rather than limit or restrict the business process. Human interfaces will be intuitive and consistent in purpose and use.
- **Manageability** – Applications, hardware and software will be easy to control and administer. Operation must be robust and secure. Achieving these basic characteristics requires a balance of assertion and responsiveness.

One Federal agency reports that it plans to include its acquisition and procurement rules and standards as part of its enterprise architecture in an effort to document its smart practices and lessons learned and make them systematic and repeatable. Following this example, think of the time and resources that could be saved by making all of our business processes, policies, standards and smart practices a part of the EA, thereby alleviating an enormous amount of duplicative effort.

It also follows that if companies do a good job on EA and it includes the current architecture, the target or modernization architecture and the capital planning processes to maintain and modernize, then as we try to keep up with the six-to-eight- month time-scale of expected delivery of projects created by the Internet, then success is much more likely because we begin the process further down the planning cycle. Does that sound preposterous? Let's examine. For every project we must ask several questions that are the same and address the need for business process reengineering. If your EA includes the business processes, then running "what if" scenarios against your processes is infinitely less expensive than running "what ifs" using technology. If your capital planning and investment control process and your systems life cycle methodology are documented as part of your EA, when legislation, policy or business changes require a specific focus such the Government Paperwork Elimination Act, IT security, or privacy, confidentiality and disability access issues, then the EA need only be modified and adjusted to accommodate the new requirement, and implementation is easier.

The Federal Government's Information Technology Resources Board (ITRB) issued its "Assessing the Risks of Commercial Off-the-Shelf Applications (COTS)," in December 1999. This document includes a tool to assist Federal organizations in clarifying the myriad risks they will encounter when facing a COTS implementation. Lessons learned and reported in the document include: understand the COTS product; examine the "gap;" incorporate lessons learned; secure required resources; focus on the data and the interfaces; involve functional users; validate performance and scalability; select mature products; and fully understand contractual conditions. An additional lesson learned is that sustainment is usually underestimated. These items should be a part of any risk assessment for an IT project involving COTS. There are also criteria listed here that are great risk factors to address whether or not the project includes COTS.

Earlier in the Project Management section of this document, we discussed the project management requirements for IT versus other assets. If we have done our jobs thoroughly in building our EA, then our current architecture for IT should make managing the projects implementation much easier, as we have documented the systems and their specifics and seriously decreased the unknowns.

RSIS tells us that when the company first started, not much thought was given to future capital planning. Making sure that the company stayed in business was the first requirement. However, putting careful planning into an architecture and corporate baseline for IT requirements that both served the requirements of the here and now but was flexible enough to support changes in the IT environment was first and foremost. This of course led RSIS to consider every purchase in the framework of how it both impacted day-to-day and the future.

Another area of concern for Federal agencies seems to be cost models and how to formulate budgets for projects in a systematic way so that, when compared at an agency or department level, the comparison is apples to apples, not apples to oranges. If your EA includes processes for formulating these costs, such as systematic and repeatable benefits and costs analysis, then you need only create the framework once and reuse it for every project until business needs either require it to be updated or deem it obsolete.

Ponder these questions: 1) What is the business of my agency or company? 2) What data or information will I need in order to operate this business? 3) What kind of applications will I need to manage this business? 4) What kind of hardware, software and network do I need?

An agency's success in improving the government's productivity through the development, implementation, and maintenance of information technology systems and services depends heavily on its ability to execute smart acquisition practices.

Over the past several years, the Executive Branch has worked closely with Congress to develop a statutory and regulatory framework to bring common sense back to the term "procurement." It is up to each agency to maximize this flexibility in making prudent business decisions. Many agencies are moving closer to commercial practices. Instead of just awarding contracts based on the lowest cost, agencies are awarding "best value" contracts, which allow trade-offs (i.e., cost, schedule, performance, risk, etc.) to be made where appropriate.

In most cases, commercial, off-the-shelf products (COTS) are suitable to meet the government's IT needs in lieu of acquiring custom-made products at higher prices and increased risk of nonperformance or incompatibility with existing systems. By doing good market research up front, you should be able to identify available COTS products and existing contract vehicles (e.g., multiple award contracts [MACs] or multiple award schedule contracts [MAS]) to use in meeting your IT requirements.

Other smart acquisition practices involve effective use of competition to obtain the best deals and the inclusion of performance incentives in contracts to motivate contractors to be innovative in deciding *how* to perform the work and tying payments to performance. Requirements in solicitations should no longer be written with detailed design specifications, but rather as broad statements of objectives (performance based) for IT function and performance. This allows contractors the flexibility to propose various alternative solutions and, with the use of appropriate performance incentives, motivates them to find cost efficiencies, schedule improvements and/or technical enhancements to meet the agency's need.

Modular contracting is an *excellent* acquisition strategy for IT systems. It allows agencies to break large IT acquisitions into smaller, more manageable segments or modules. The key is to remember that each module must be an economically and programmatically viable module (i.e., a useful stand-alone segment), even if no further funding is appropriated. Given the dynamics of technology advances and agency priorities, this strategy provides the flexibility to design subsequent modules such that improvements in technology and revised agency priorities can be accommodated at minimal risk to the agency.

Several agencies report using their EA in order to ensure that proposed or planned projects are capable of interoperating and sharing information with existing systems of the IT architecture. DISA reports interoperability issues as a key discriminator for investment approval.

RSIS reports that when their company was started, if a computer, server, or any piece of IT equipment was needed, it was approved by the President of the company and a purchase was made. Over the years, RSIS has added an MIS department to handle both the purchase of IT equipment and the management of its IT system. Every effort has been made to standardize systems while leaving them flexible enough to support changes in the IT architecture. RSIS documented procedures, although written and implemented, are in the beginning stages and are changing with the growth and needs of the organization. All IT needs are assessed on both a yearly basis for the company and as needed in special cases. One benefit realized in this growth is the ability to make larger bulk purchases. Cost savings are realized and discounts are given, allowing for more buying power. Every three years, a complete technology refresh should be realized in the company. Also, by depreciating capital IT assets over time, the total cost of IT purchases becomes a smaller realized cost.

After recommendation and approval by the MIS Department Director, a budget for IT expenditures is given to the company Controller for inclusion in the yearly budget. This budget is then given to the President of RSIS for final approval and corporate implementation.

TOOLS AND TECHNIQUES

No automated tool will give a company a process, but well-thought-out tools that are designed to meet the business needs can propel a process to success. There are many tools and techniques available in both private and Federal organizations to enable capital planning, enterprise architecture, performance management and strategic decision-making processes. This section provides information on a few of them in use today.

The U.S. Customs Service has developed an automated tool, the **Enterprise Architecture (EA) Repository**, to support the management, maintenance and analysis of their enterprise architecture. Over the past several months, the Department of Housing and Urban Development, working with both Customs and OMB, has tailored and advanced some of the features and functionality of the Customs EA Repository to provide a more robust resource for supporting their own IT capital planning and investment control process.

The HUD **EA Management System (EAMS)** is a Web-based tool that provides organization-wide access to HUD's baseline and target architectures, including the full range of interrelationships and linkages across their EA's business, data, application and technology infrastructure layers. The EAMS also offers access to HUD's Technical Reference Model and associated technical standards and development frameworks.

In terms of its practical utility, the EAMS provides HUD with an extremely powerful management and analytical tool that is helping the organization to achieve the following:

- Rapidly baseline their current EA, identify opportunities for improvement, define their target EA and develop and monitor transition projects that will help them realize their target positions. These transition projects will be included in the agency's IT investment portfolio and will be monitored and controlled in accordance with HUD's quarterly IT investment portfolio and project review process.
- Use the EA to help guide the selection, control and evaluation of new, ongoing and fully operational IT-related projects and initiatives. IT investment decisions are based on the extent to which proposed projects are consistent and compatible with the HUD EA, that they are fully aligned with the agency's missions, goals, and objectives; are not unnecessarily duplicative; and comply with governing or target technical reference models, standards and development frameworks.
- Better understand and capitalize on opportunities to improve electronic service delivery and to protect information and IT assets. The EAMS will make it easy to identify and target e-government solutions; identify important security- and information-assurance-related IT assets; and comply with recent statutory mandates such as GPEA and E-SIGN.

HUD plans to further refine the EAMS and will make it available to other Federal agencies over the next few months. The system shows much promise at HUD and for other organizations that are trying to gain command over their architecture activities. Indeed it will be an important addition to the growing toolset that agencies can acquire to support their IT investment management, e-government and cyber security activities.

EDS uses a **complete IT strategic planning process** that involves the following activities that complement work done in the Federal Enterprise Architecture Framework:

- Business Focus – Develop a business context working paper that will clarify, validate and substantiate business strategy and direction, and also rationalize business and IT alignment. This deliverable will also characterize the client-specific enterprise business architecture to include business processes and functionality, and current business operating and IT environments.
- Enterprise Business Architecture – Model the enterprise business architecture to reflect what an enterprise is doing today as well as what it will do in the future to accomplish particular business requirements. This view is based on the business context and the guidance provided by

strategic business plans. The business architecture defines the business organization structure, IT investment and expenditure profile, business process architectures (value streams), workflow scenarios, and the enterprise operating environment within which they all exist. It is the business context and business architecture that will provide the rationale for the future enterprise IT architecture baseline and development.

- Technology Policies – Develop and provide a technology policies reference deliverable that identifies IT strategies, policies, standards and architectural guidelines that will direct the transformation of IT to an integrated, standards-based environment. The technology policies will be driven by business requirements and processes and industry and technology drivers. The deliverables will serve as the foundation and the set of building codes for the design, development, procurement and maintenance activities related to new and existing systems as well as deployment of the enterprise IT architecture.
- Enterprise IT Architectures – Develop the enterprise IT architectures that provide a logical overview of and framework for the information, application, infrastructure, and enterprise IT systems management environments that will enable the enterprise business architecture. The business context and characterization of the enterprise business architecture will be used to derive the rationale and structure for the IT architectures. The IT architectures and technology policies are used in combination to frame application development or procurement activities in terms of flexible structures, standards and products. Based on the components and elements of the Enterprise Strategic IT Planning Framework Tower, the enterprise IT architectures will consist of the following components:
- Information Architecture – Represents what information must be delivered to individuals across the enterprise to help them effectively execute the business processes and make informed decisions. This architecture contains the information and data management framework and precepts; the business intelligence component processes; the geo-structural view of information-specific technology deployment; and the information-application software portfolio.
- Application Architecture – Serves to support business process execution (value stream enablement) and bring information and data to the process. The application architecture defines the application software portfolio and integration relationships. Application inputs and outputs are identified as well as the application geo-structural view for deployment. Guiding principles, standards and design characteristics support the acquisition as well as the integration of applications.
- Technology Infrastructure Architecture – Enables access to information and provides support for the execution of activities. This architecture contains the standards and policies or building codes for infrastructure construction. This architecture also contains a characterization of the current infrastructure environment to provide the baseline for the target environment, and identification and views of the future geo-structural layouts with IT platform requirements and characteristics that will provide the basis for engineering blueprints.
- Enterprise IT Management Framework – Deals with the business and organizational management of providing IT services and products (such as the application development environment), the management of the services, IT systems and network management (to include security), as well as element management. This would also encompass the enterprise IT management organization capabilities, competencies, skills and performance models necessary to implement the desired culture and behaviors.
- Transition Plan – Identifies high-level project initiatives for transforming the current technology infrastructure environment to the target environment formulated in the enterprise IT architecture over a two-

to-three-year period. This plan serves as the foundation for the enterprise's modernization, planning and acquisition activities.

HUD uses a number of tools to support effective capital planning. HUD has used the **Information Technology Investment Portfolio System (I-TIPS)** as the repository for system information and as a program management tool for three years. The agency is currently working to link its architecture repository to I-TIPS. This will help to ensure that architecture issues are integral to capital planning. It is also incorporating Expert Choice, a decision support tool, into I-TIPS. Expert Choice allows the agency to change the relative importance of investment selection criteria on the fly to see the impact on the investment portfolio. HUD has linked its accounting system to I-TIPS on a project-by-project basis to ensure accurate reporting of costs and maintain one source for data for HUD.

It is extremely encouraging to see the partnerships that continue to form between Federal organizations as they work to strengthen their management and business processes. The use, refinement and reuse of tools that work is a smart practice.

The formulation and maintenance of an agency IT portfolio is both a serious and a complex undertaking. Since the passage of the Clinger-Cohen Act in 1996, the search has been on to identify methodologies and tools to help establish and maintain rational, reasonable and repeatable IT capital planning and investment control processes. With no practical tool available in the marketplace, the Federal Government contributed part of the solution with the

development of the Information Technology Investment Portfolio System (I-TIPS), a Web-based e-government solution that supports the selection, control and evaluation of IT projects and initiatives as well as the reporting of OMB and other Federal review and oversight organizations.

I-TIPS houses a broad range of information on the business purposes, technology, costs, risks and return of a specific IT project. However, it cannot automatically analyze that information, nor can it suggest a recommended portfolio based on precise judgments on the "value" that a project will have to the Agency mission, goals and objectives relative to other projects competing for agency funds.

The agencies using the Information Technology Investment Portfolio System (I-TIPS) will have the ability to provide all of their IT budget information electronically to OMB for fiscal year 2002 budget submission. OMB is not mandating I-TIPS but we do believe it is a useful tool for capital planning. However, I-TIPS will not give you a capital planning and investment control process if you do not already have one. Rather, it's meant to assist you in managing your investments. There are over 20 agencies currently using I-TIPS to some degree for their capital planning.

The following 11 agencies participate in a government-wide service level agreement that governs this automated capital planning and investment control tool: General Services Administration; Department of Interior; Department of State; Department of Agriculture; Department of Housing and Urban Development; Department of Commerce; Department of Education; Department of Energy; Department of Treasury; Department of Veterans Affairs; and Department of Labor. These 11 agencies represent more than one-half of the investments for IT in the civilian agencies. There are also a number of defense agencies currently using I-ITIPS.

Additional agencies using I-TIPS or in the process of acquiring I-TIPS include the Environmental Protection Agency; U.S. Transportation Command; Federal Energy Regulatory Commission; Wright Patterson Air Force Base; Naval Air Systems Command; Small Business Administration; and Defense Intelligence Agency.

There are several other agencies, states, and local governments exploring I-TIPS that have yet to make a decision.

EDS developed **E-Genesis**, a transformational framework that encompasses the family of EDS capabilities, frameworks, processes, governance and intellectual capital that support the components of the EDS service continuum, planning, design, engineering, operations, and management of IT services. The key components of E-Genesis are: the strategic IT planning framework (what); the IT processes, frameworks, and methodologies (how); the emerging technologies and industry drivers (influencers); the technology policies (guidance); the knowledge store (repository) for information from the Global Delivery organization; and the technical compliance frameworks that govern the integrity and use of the component architectures.

E-Genesis provides EDS with a standard approach, structure and terminology for business and IT architects to promote reuse of architecture and design models and provide the basis for architectural services to accounts and business units.

At the core of E-Genesis is the Enterprise Strategic IT Planning Framework "Tower" (patent pending) model. The Tower is built on the foundation of the essential, mandatory components of an enterprise architecture that addresses people, processes, and technology. The Tower defines what must be built and identifies the relationships for the integration of the integral components of the enterprise architecture. These components are pertinent to all phases in the service continuum. In the instance of strategic IT planning, these components are relevant to the creation of enterprise IT plans, architectures and strategies. These components then become the building blocks for further definition and decomposition as IT projects proceed through design, engineering and implementation.

The Tower is the starting point for determining the context and the foundation components and elements needed to build a strategic IT plan, enterprise architecture, architecture components and enabling IT solutions and strategies for an enterprise. The components and elements identified in the Tower help planning practitioners effectively analyze and evaluate technology requirements, put them in the proper business context and ensure that due consideration is given to all of the business and technology components necessary to address and support business drivers and modernization requirements.

The Tower also provides the baseline against which an EDS strategic unit can measure a client's current environment and initiatives to ensure they are working with and within a comprehensive framework for the design, engineering, acquisition and deployment of technology-enabled solutions to meet specific business goals.

The collection of frameworks, processes, procedures and methodologies that are employed in how the components of the enterprise Tower are identified, created, enhanced, deployed, managed and operated are collected in the Plan ITs framework under E-Genesis.

EDS uses an approach that provides a comprehensive and deliberate approach for aligning business and technology objectives within a best practices, benchmark IT framework. This gives the business enterprise the means to respond to an increasingly complex and rapidly changing business and technology environment. IT resources, like all resources, are limited and must be invested wisely.

EDS' approach addresses the challenge of providing the appropriate technology direction and recommendations necessary to effectively support an organization's business vision, goals, and processes and align enabling technology with strategic business objectives. To most effectively support a strategic business plan, the strategic IT planning should follow a business transformation initiative.

Expert Choice is another Web-based tool, developed by private industry and readily available in the marketplace, to support IT investment analysis and portfolio selection. It does what I-TIPS cannot do. It can help Federal managers and staff quickly identify, define, achieve consensus on and apply uniform and consistent criteria to rank, prioritize and select IT projects. Indeed, the tool has been used very successfully at HUD over the past two and a half years and is an integral part of their IT capital planning and investment process. Senior officials at that agency, including the Deputy Secretary and all of the Assistant Secretaries and Principals, work with Expert Choice to establish enterprise-wide IT investment decision criteria that govern the formulation and ongoing management and maintenance of the agency's IT investment portfolio. HUD has carefully combined the criteria development and analytical capabilities of Expert Choice with the information that is housed in I-TIPS to provide a total IT investment management solution.

Structured yet streamlined business decision-making, including the use of Expert Choice, is also applied in the private sector. Booz·Allen heeded the advice they give to their clients and applied their approach for employing Expert Choice to their own recent IT sourcing decisions. This approach resulted in greatly improved, consensus-building IT sourcing decisions for both help desk and communications contracts.

Applied information economics (AIE), a performance management tool developed by Douglas Hubbard, prides itself on being more scientific than its counterparts. AIE focuses on the requirement to measure traditional intangibles, such as customer satisfaction and strategic alignment, then applies various tools borrowed from actuarial science, portfolio theory and statistics to calculate the value of information. The approach relies on the tenets of decision theory to accommodate multiple strategies with uncertain outcomes, which seems to be appropriate to address the rate of change in IT skills and resources as well as customer expectations that any complicated system can be built and running in several months.

Several Federal agencies report that they use a performance management tool called **"Balanced Scorecard."** This methodology was designed by Robert S. Kaplan of the Harvard Business School and David P. Norton of Norton and Company. They conceived of the "balanced scorecard," which combines both financial and operational measures into an integrated system of performance indicators. The scorecard operates on the premise that no single measure is adequate for managing all companies in the same way and allows an organization's central vision of what it must do to be "number one" with its customer base to provide the indicators. The scorecard includes at least four perspectives: the financial perspective, the customer view, the internal operating perspective, and the innovation and learning perspective.

The state of California's Department of Information Technology created a tool called **The Risk Assessment Model (RAM)** that assists the Department of Information Technology (DOIT) and hundreds of project managers in the state of California with quantifying and summarizing information technology (IT) project risks. The model breaks down IT project risk into several categories: strategic, financial, project management, technology and change management/operational. A project receives a risk "score" in each category. The scores ultimately are scaled against a calibrated index to show high, medium or low risk. A summary of the risks is presented graphically in terms of red, amber or green in each risk category, providing a simple yet vivid risk "picture." The objective of such information is to provide the DOIT and the project manager with focus areas for risk mitigation. Several Federal agencies report using RAM as the basis from some of the risk assessment processes included in their capital planning and investment control processes.

California reports that the technical implementation of the model consists of client software that the project manager uses to perform an assessment of a single project. The individual RAM surveys are collected by a centralized application that displays all projects and their ratings, providing several levels of summary, from project through state-wide. Historical information is retained and can be analyzed for "risk deltas" (changes in risk) over the life of the project. This information can be combined with other factors and historical data (lessons learned) to assist the DOIT in developing an effective risk mitigation knowledge base. In line with the model's spirit of "constant improvement," California is in the process of updating this tool to reflect lessons learned throughout its execution.

As discussed earlier, the CIO Council created a Performance Management Subcommittee in late 2000, to begin to address the issue of performance measures and goals for all of the Federal Government's IT investments. The CIO Council tapped Pat Plunkett of GSA's Office of Government-wide Policy to co-chair the subcommittee. **The CIO Measurement Kit** was designed by Pat and offered as a way to jump-start the improvement effort. Several agencies have already begun to include this in their toolkit for improving performance measures and goals.

Purpose: The Measurement Kit provides basic, yet essential, information to better manage an agency's information technology (IT) assets and services. The measurement information collected becomes the backdrop for effective capital planning. It also provides the measurement foundation by which

Chief Information Officers can determine to what degree IT contributes to their organization's bottom line.

Background: New Chief Information Officers will want to know several aspects of the IT operation they inherited. At a minimum, these are: the resources spent on each major system; which organizational units are the primary customers; and how satisfied they are with the systems. CIOs should also want to establish a baseline against which to compare their performance during their tenure.

To meet the needs of CIOs, the CIO Measurement Kit consists of the following components: cost, user satisfaction, alignment, baselines and targets. Gathering and maintaining information on these will provide insight to focus IT resources where they can have a measurable impact on an agency's mission.

Cost: Know what is being spent on whom, where and why. What is the allocation of IT spending? How much is spent (i.e., systems and support) on each major system? How well does the spending match the priorities of the agency and its performance goals? According to the Gartner Group, governments in general spend about 80 percent of the IT budgets on supporting, maintaining and enhancing their legacy systems. That only leaves 20 percent for new starts. Where should IT funds be directed to have the most impact? What needs to be done to achieve 90 percent of the cost estimates?

User satisfaction[1]: This is an early warning indicator as to the quality and effectiveness of a particular system. If users are dissatisfied, then it's questionable whether that system will make much, if any, contribution to mission results. The more satisfied users are, the more likely it is that the system will be used, that users will be productive and that mission objectives will be achieved. Satisfaction should focus on the quality of the system, information and service provided. Obtaining user feedback often uncovers ways to improve the system and can foster better relationships with the user community. How satisfied are the users of the agency's major systems? What would they like to see improved?

Alignment: The closer IT systems are aligned to mission goals and objectives, the greater the likelihood that the IT systems will contribute to mission results. If the business or organizational objectives are poorly defined, then alignment will be difficult to ascertain. What are the measures the agency uses to judge performance? Are they being used? Logic models help determine alignment.
A logic model is a diagram that shows the flow of results. For example, "*If* the system provides this information, *then* the user will perform a particular task better, faster or cheaper (BFC). *If* that task is performed BFC, *then* customer service will improve. *If* customer service is improved, *then* mission performance will improve." Logic models are more accurate if they are developed with program personnel. By measuring key results (e.g., BFC) along the "flow of results," CIOs will be able to determine whether the IT system is on track and make adjustments as necessary so that an IT initiative does contribute to mission results. CIOs need to have measures for both the IT domain and the business domain.

Baselines: Used to compare and evaluate future performance. Choose meaningful measures for both the IT and business domains. If baselines do not exist, simply create them by choosing measures and collecting the data. Make sure the data match the measures. CIOs can jump-start or improve their existing measurement efforts by considering performance measures used by other organizations and comparing performance levels with organizations with similar business lines.

Targets: Looking to the future, select targets that will contribute the most to mission results. How are the targets for the IT initiatives aligned? Do they match the performance goals and priorities of your organization over the next three-to-five years? How will the achievement of those targets contribute to the performance goals?

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[1] For new starts, user satisfaction refers to the existing system. This will not be true or available for all new starts. Also, for some systems, e.g., e-business, users will be outside the organization. Arrangements will need to be made to collect feedback from them.

Implementation: Measurement doesn't just happen. To provide useful and reliable information, measurement must be systematic, iterative and important to management. The information collected must be used for decision-making (e.g., during the capital planning process); otherwise, people who collect the data will not take it seriously.

Approach: For each major IT system, identify or determine the following:

- System Type: Legacy or new start
- Business Owner(s): Internal organization(s) that is currently using or will use the system
- Process Supported: Core or noncore
- Cost: Amount allocated annually and projected in the future
- Alignment: Develop a logic model with users to show IT's link to the mission. Users judge the degree the system aids them to complete their objectives. Determine which performance measures your organization uses and how each major system contributes to them.
- Baselines: Choose measures, use existing data or collect new data.
- Targets: Using a logic model, develop performance targets that will contribute to your organization's performance goals and match its priorities.

Benefits: CIOs will be in a better position:

- To determine IT's contribution to mission results
- To determine if the IT budget is being allocated to best achieve IT and organizational objectives
- To improve relationships with users and management by greater attention to user satisfaction
- To align IT systems to mission objectives
- To identify opportunities to streamline processes
- To improve relations with their business counterparts

The General Accounting Office developed the **IT Investment Management (ITIM) Framework** (GAO/AIMD-10.1.23) to provide a common structure for discussing and assessing IT capital planning at federal agencies. ITIM enhanced previous federal IT investment management guidance by embedding the Select/Control/Evaluate approach within a description of the organizational processes required to successfully carry out good investment management processes.

ITIM describes 15 processes that are critical to instituting an effective IT investment management program in any organization (Figure 1). While the specific implementation of these processes should be designed for the particular needs and environment of the individual organization, the underlying activities are necessary to guide the organization on the path to good management practices.
The 15 critical processes were developed based on relevant laws, prior guidance and the practices of leading public and private sector organizations. ITIM went on to group the critical processes into five stages which represent the steps toward achieving both a stable and a mature investment management program. With the exception of Stage 1, each maturity stage is composed of critical processes that must be implemented and institutionalized for an organization to satisfy the requirements of the maturity stage. Within a stage, all processes are equally critical, and Stage 2 processes should be implemented before Stage 3 processes and so on.

One way to use ITIM is to conduct a self-assessment, comparing one's own organization against the criteria of the 15 critical processes and the key practices that define each process. Once the organization understands what critical processes and key practices are being executed, available resources can be directed toward those areas that need attention. By following ITIM, the organization can understand where it stands and know that, to move forward, the more fundamental processes (those in the lower stages) must be complete.
This does not mean, necessarily, that higher-level processes should be abandoned, though that action might be considered in the face of scarce resources to apply to the more fundamental processes.

ITIM is both an IT investment management self-assessment tool and a guide to implementing good investment practices. It has been designed to be consistent with the law, OMB requirements and the practice of leading organizations in the private and public sector. Individual organizations may find that specific practices must be adapted for effective use within their organization. However, the critical processes and stages of maturity represent fundamental principles of good IT investment management.

ITIM Maturity Stages and Critical Processes

STAGE 5 **Leverage Information Technology for Strategic Outcomes**	**Investment Process Benchmarking** **IT-Driven Strategic Business Change**
STAGE 4 **Improving the Investment Process**	**Post-Implementation Reviews and Feedback** **Portfolio Performance Evaluation and Improvement** **System and Technology Succession Management**
STAGE 3 **Developing a Complete Investment Portfolio**	**Authority Alignment of IT Investment Boards** **Portfolio Selection Criteria Definition** **Investment Analysis** **Portfolio Development** **Portfolio Performance Management**
STAGE 2 **Building the Investment Foundation**	**IT Investment Board Operation** **IT Project Oversight** **IT Asset Tracking** **Business Needs Identification for IT Projects** **Proposal Selection**
STAGE 1 **Creating Investment Awarness**	***IT Spending Without Displined Investment Processes***

Figure 1

SYNOPSIS AND FINAL STATEMENT

We created this document by compiling viewpoints and guidance from the oversight communities, the laws and regulations governing IT management, and Federal agency and private industry experts. It is the hope of the Capital Planning and IT Management Committee and IAC that anyone reading or utilizing this document will find it useful in designing or standing up their own processes, and that we have identified areas to avoid, and in the process discover "smart practices" to share.

As noted earlier there are three strong tenets of CCA: capital planning, enterprise architecture and the human resources to accomplish both. The Federal agencies seem to have begun addressing capital planning and enterprise architecture, but have not yet scratched the surface in the area of human resources. This was most evident in the guide's discussion of project management, but was a theme throughout each section.

While CPIC and EA are extremely important in achieving success, human resources and their impact on the processes cannot be overstated. This area of human capital is evident in each of the phases of CPIC. Some private companies state that there are business opportunities that are not attempted simply because the right people are not available. Federal agencies report the same thing to be true and are working on ways to address these weaknesses, such as the work being done by the CIO Council's IT Workforce Committee.

Yet another way human resources impacts the processes is that CPIC and EA require a different way of thinking by senior management in the companies. The day of the IT services group being isolated in one area of the company and business in another has long since passed. The rate of change required for businesses to succeed in this world of e-business and e-management is increasing daily, while the rate of change for IT continues to skyrocket. The only way companies can win business is a partnership wherein IT knowledge comes together with business knowledge and forms a business synthesis.

The partnership of Senior Executives in both private and public companies is essential to a company's success. There is a multitude of disciplines that must conjoin in order to achieve capital planning and investment control. Strategic planning, budget, procurement, acquisitions, contracts, enterprise architecture, budget formulation and forecasting, marketing, project management and human resources were among the processes most noted in this effort.

A recurring theme was that "Companies do not know whether or not they can get to where they are planning to go unless they first acknowledge where they are." This issue was evident in the strong emphasis of the EA to CPIC efforts in all of the companies - smallest company to largest agency. Once the EA with all of the business processes and functions, data required to perform them, applications of the data, and the technology required are established, then business could more strongly define the process that IT needed to enable. IT could in turn explain the smartest technology available that the company's architecture could deliver and what it would take to achieve the goal.

The CPIC process then was used to ensure the risks were mitigated, the benefits achieved and the overall performance of the IT investment was healthy at all times. Each IT investment must achieve its part in an organization's transformational journey to modernize the business, its processes, and the delivery of both via information technology.

This document is not intended as the "one way" all organizations must perform Capital Planning and Investment Control, but rather as a synopsis of the "smart practices" currently employed in several private and public organizations.

As a companion to this guide, we are providing an electronic tool that allows you or anyone in your organization to assess the processes you use for decision-making about your IT investments. The tool is tailored to the sections of this book and provides an analysis and rating of high, medium or low for each area. The tool provides a reflective statement for each score. If your score indicates room for improvement or you would simply like to see how you compare to the participants of this process, turn to the appropriate section in the guide for details.

The guide and several other tools discussed in the document can be found on the Federal CIO Council's Web site at http://www.cio.gov.

APPENDIX I - (SHORT QUESTIONNAIRE)

Strategy - A clearly articulated mission and vision statement conveys what the agency does, and for whom, and maps where or what the agency would like to be in the future. A strong vision describes how the agency will accomplish its overall mission**.**

	Strongly Agree	Agree	Disagree
Our agency has clearly communicated its strategic IT planning process for soliciting input and feedback from others.			
Our agency is implementing its strategic plan.			
Performance goals are clearly stated in our agency's strategic plan.			
The implementation of our agency's strategic plan has produced tangible results.			
Our organization has performance measures that are used to gauge the achievement of desired outcomes and to reward performance accordingly.			

Business Focus - Technology should emphasize business value and solutions rather than technical sophistication. Although technology may drive changes in business processes, it is important that these changes are prioritized because of the benefits that they bring to a process, not simply because they are technically attractive.

	Strongly Agree	Agree	Disagree
Our IT systems usually attain expected business results for customers.			
Members of our organization understand how technology is used to meet critical business objectives.			
Our high-priority business requirements drive the capital resources necessary to acquire and implement IT systems and solutions.			
Our agency's business objectives emphasize implementing architectures that support technical standards.			
Incremental system implementation provides usable levels of functionality to support specific business objectives.			
Project-level technical architectures ensure consistency with the overall IT architecture of our agency.			

Leadership - Agency Executives are responsible for ensuring that the agency achieves its mission. To achieve desired results, Executives must mobilize staff, manage resources, engage constituencies and customers, supervise work operations and oversee an array of management processes. Among agency Executives, the Chief Information Officer (CIO) and Chief Financial Officer (CFO) hold important responsibilities for ensuring that the agency effectively uses IT. Their responsibilities converge in a number of areas, such as IT capital planning, financial transaction processing and human resource management. Complex converging leadership responsibilities make it particularly critical for agency Executives to communicate and cooperate effectively.

	Strongly Agree	Agree	Disagree
Our top executives effectively communicate their decisions to people outside of the agency.			
Our CIO has the authority and visibility necessary to oversee all IT decisions.			
Our CIO and CFO ensure that business objectives take precedence over technological advances.			
Our CIO and CFO have a productive working relationship.			
Our Executives encourage Project Managers to communicate effectively and openly about project status.			
I know who is responsible for making major technical decisions.			

Capital Planning - is a collective decision-making process for ensuring that IT investments integrate strategic planning, budgeting, procurement and IT management in accordance with the agency's business objectives. Participation by high-level agency managers and functional-level IT Executives is critical for successful capital planning. These key contributors facilitate decision-making about IT investments by using a formal systematic process that determines priorities for making funding decisions. An effective capital planning process requires long-range planning and a disciplined budget process as the basis for managing a portfolio of capital assets to achieve performance goals while incurring the lowest life-cycle costs and assuming the least risk.			
	Strongly Agree	**Agree**	**Disagree**
Our IT investments reflect business priorities.			
Our capital planning process establishes an explicit link between each plan and the IT architecture.			
Our capital planning process encourages necessary business process revisions before IT investments are made.			
We use standardized criteria to compare IT investments.			
Projects are modified throughout their life cycles on the basis of the outcomes of our capital planning process.			
Our capital planning process includes approval thresholds that lead to decisions about resource allocation.			
Our capital planning process includes clearly defined approval thresholds that channel project decisions to the appropriate levels of the agency.			
We prioritize competing opportunities for technology investments to maximize the effective allocation of limited funds.			
Our cost and benefit estimates are sufficiently reliable for use in capital investment decisions.			
Our capital planning process effectively controls costs.			
Our agency's capital planning process incorporates actual results to support the evaluation of IT projects.			

Project Management - is the rigorous discipline of planning, directing, and controlling resources for a relatively short-term objective that is established to complete specific goals. Project management includes planning and implementing within a designated cost and schedule and at a desired performance and technology level. The practice of project management can focus efforts on the agency mission by aligning project priorities, leveraging resources, and delivering services and products to customers. A successful project translates a broad public mission into concrete results and outcomes. An effective project manager therefore must possess a wide range of project competencies, including management of project integration, scope, time, costs, quality, human resources, communications, risks and procurement.			
	Strongly Agree	**Agree**	**Disagree**
We manage IT projects in a standardized, rigorous way.			
Our project managers work with customers to reach mutually agreeable decisions about IT projects.			
Our customers are appropriately involved throughout the project life cycle.			
We use clearly defined communication channels to share information about changes, delays and new developments for IT projects (e.g., changes in cost, schedule, and budget).			
Our project managers are accountable for the results of IT projects.			
Standardized project management processes and techniques are effectively applied to our IT projects.			
We compare estimated project time frames and costs to actual project time frames and costs.			
We use work breakdown structures to organize project activities and tasks.			
Each of our project teams includes a core group of employees who, as a rule, remain on the project throughout its life cycle.			
We compare estimated security and privacy costs to actual costs.			

Performance Management - Performance- and results-based management links IT projects to agency program improvement goals and objectives, as required by the Government Performance and Results Act, Federal Acquisition Streamlining Act, and the Clinger-Cohen Act. An effective performance management system includes a baseline of IT performance, clarifies the expected target performance and identifies the process that IT managers and customers will use to work together to improve IT performance and thus enhance mission delivery. Performance measures provide input for resource allocation and planning and are used to furnish periodic feedback to employees and customers about the quality, quantity, cost and timeliness of IT products and services.

	Strongly Agree	**Agree**	**Disagree**
Our organization's strategic plan identifies key performance measures.			
Our organization uses a consistent approach that links key business priorities to organizational IT goals, objectives and measures.			
Our performance measures support the agency mission and vision as well as our relationships with customers.			
We continually assess the adequacy and appropriate focus of our performance measures.			
Our employees understand how IT projects contribute to performance goals.			
We evaluate not only the overall performance of the IT function, but also the results of individual IT investments.			
Our performance measures drive IT planning and delivery.			
We reexamine IT systems over time to ensure that they continue to support evolving performance goals and business priorities.			
Our performance data are accessible and reliable, and we collect the data by using the least burdensome techniques.			
Our organization performs periodic cost/benefit analyses and life-cycle cost estimates for our systems.			
Our CIO organization uses performance data when making decisions and allocating resources.			
Our progress on critical measures is effectively communicated to agency leaders.			
We have established security goals and measures and privacy standards in accordance with Federal guidance.			

Technology (Acquisition) - The agency's strategic objectives drive its IT acquisition practices. To develop, implement and maintain effective IT systems and services, acquisition practices must translate the agency's vision into clearly defined requirements and deliverables. Over time, contract administration practices are critical for establishing routine linkages among acquisition activities and defined business needs. Acquisition and contract administration practices are becoming increasingly important as agencies seek to acquire not only technical systems and services, but also core IT capabilities.

	Strongly Agree	**Agree**	**Disagree**
We effectively monitor and control contracts.			
We usually conduct IV&V testing for each significant contract component.			
We have a fair process for the ongoing evaluation of contractor performance.			
Our organization's executives possess sufficient acquisition and contract experience.			
Each of our contracts includes an established configuration control process.			
We have an effective process to ensure that we can still meet mission-critical needs if a contractor fails.			

Technology (Architecture) - An IT architecture is a set of business processes, applications, data descriptions, technical infrastructures and information flows and relationships that are organized to enable an organization to integrate its business processes and goals with its IT acquisition. The IT architecture focuses on work processes, information flows and technical standards to provide specific services and achieve specific strategic objectives. The CIO is primarily responsible for developing, implementing and maintaining the agency's architecture.			
	Strongly Agree	**Agree**	**Disagree**
Our IT architecture supports strategic business requirements.			
We require compliance with the IT architecture as a prerequisite for approval of new initiatives under the capital planning process.			
Our architecture is sufficiently flexible to accommodate changes over time in business processes and technology.			
We have a useful concept of operations that clarifies the functions, roles and responsibilities necessary for the implementation and management of the architecture.			
An effective process is in place for assessing the current status of our architecture.			
We develop and test prototypes of new business functions before they are implemented in the architecture.			
Our architecture is sufficiently open to enable migrations to new platforms and the insertion of new technologies.			
We have conducted a comprehensive security analysis.			
We have conducted a privacy impact assessment.			

APPENDIX II - REFERENCES

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RGII Technologies, Inc. at http://www.rg2.com
SOZA and Company, Ltd. at http://www.soza.com

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